



**Mission Success Starts With Safety**

**2006 SMA Compliance Verification and Supplier Assurance Workshop**

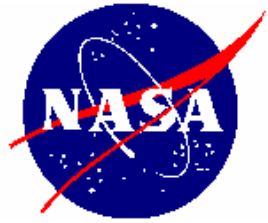
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# **SMA Challenges at a Research Center**

## **A Langley Research Center Perspective**

**Presenter: Don Porter**

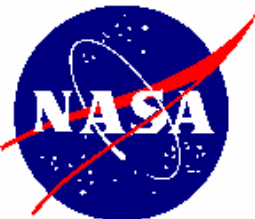
**September 26, 2006**



## Topics

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- **Facility Assurance & OSHA “Challenges”**
  - Fixes or Efforts Underway
- **Mission Assurance “Challenges”**
  - Funding
  - Staffing
  - Domain Knowledge
  - Research Culture “Challenges”
    - Projects
    - IPS
  - Fixes or Efforts Underway
- **Summary**



## LaRC Facility Safety & OSHA “Challenge”

- **Center Budget has been Declining**
  - ‘07 CM&O baseline - more pressure on CM&O
  - Critical Hires historically, not in OSMA
  - Leads to Lean Staffing

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- **Safety Program leverages off Personnel outside OSMA**
  - Facility Safety Heads, Coordinators, Safety Committees
  - Actually a good practice

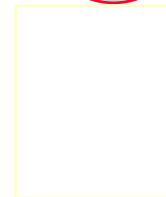
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- **Loss of Experienced Personnel through Downsizing (buyouts, retirements)**

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- **Contracting Out - Safety Responsibilities (ROME Contract)**

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- **Persistent Small Percentage of Folks that don't focus on Safety**
  - Careless, In a Hurry
  - Not the Main Focus, Safety -not my job



**Increased  
Potential for  
Process  
Breakdowns &  
More Severe  
Mishaps**





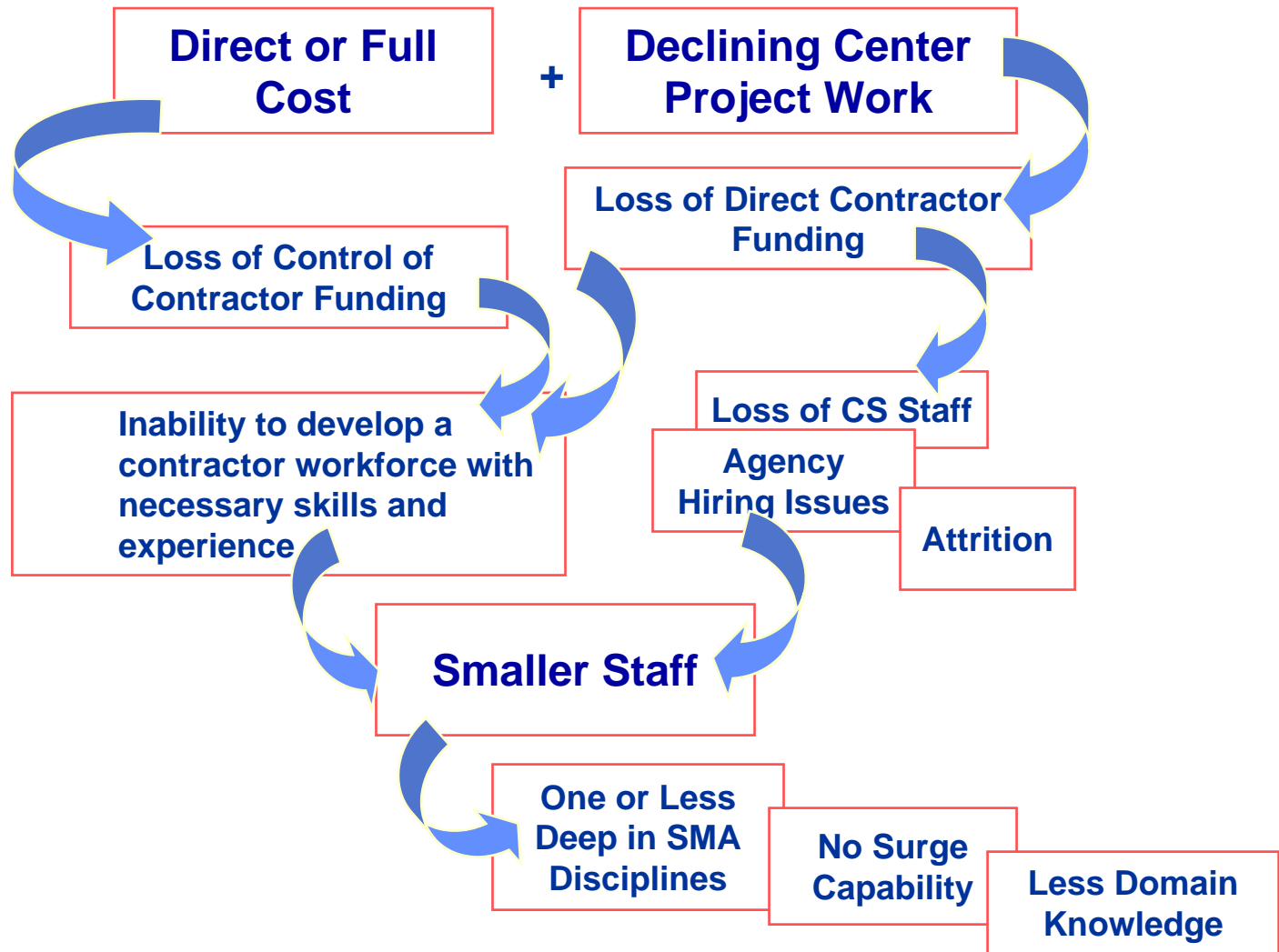
## **Fixes for the Facility/OSHA Challenge**

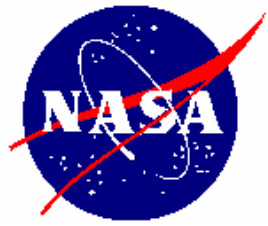
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- **Center has reversed downward staff trend**
  - Re-assignments
  - Details
  - Backfills
  - New Hires
- **Increased Emphasis**
  - Being in the “Field”
  - Better Communication
  - Teamwork
- **Awareness and Center Management Support**
  - Recent Close call briefed to Senior Management
  - Improved Executive Safety Council Meetings
  - Center Director & SMA Director personally briefed Line and Project Managers on recent Close Call and Importance of Safety



## Mission Assurance “Challenges”





## **Fixes for the MA Challenges**

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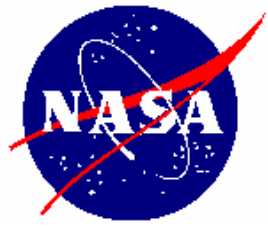
- **New Work at the Center**
  - Constellation
- **Center has allow critical hires for Mission Assurance**
  - 1 backfill
  - 5 new term hires
- **New Proposals going in with Full Cost**
  - Will allow for surge capability with contractors/term hire
- **Center Director is initiating a SMA Rotation Program**
  - Announced last week
  - SMA Deputy Director from outside SMA
- **Make Better Use of Training Opportunities**
  - Multiple Avenues for Engineering Disciplines
  - Use New Safety Center



## **Other MA “Challenges” Due to Research Culture**

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- **LaRC work balance (historically) split between 60% Aeronautics and 40% Space Related work**
- **A large percentage of the Aero work, Structures and Materials, & Systems Analysis work is in NON-flight hardware development areas - Basic Research and Applied Research**
- **A major challenge is defining the role of MA in those “Research” Areas**
- **Recently, this challenge manifested itself in two areas**
  - **Project/SMA Involvement**
  - **Recent IPS**



## **Research Culture Challenges**

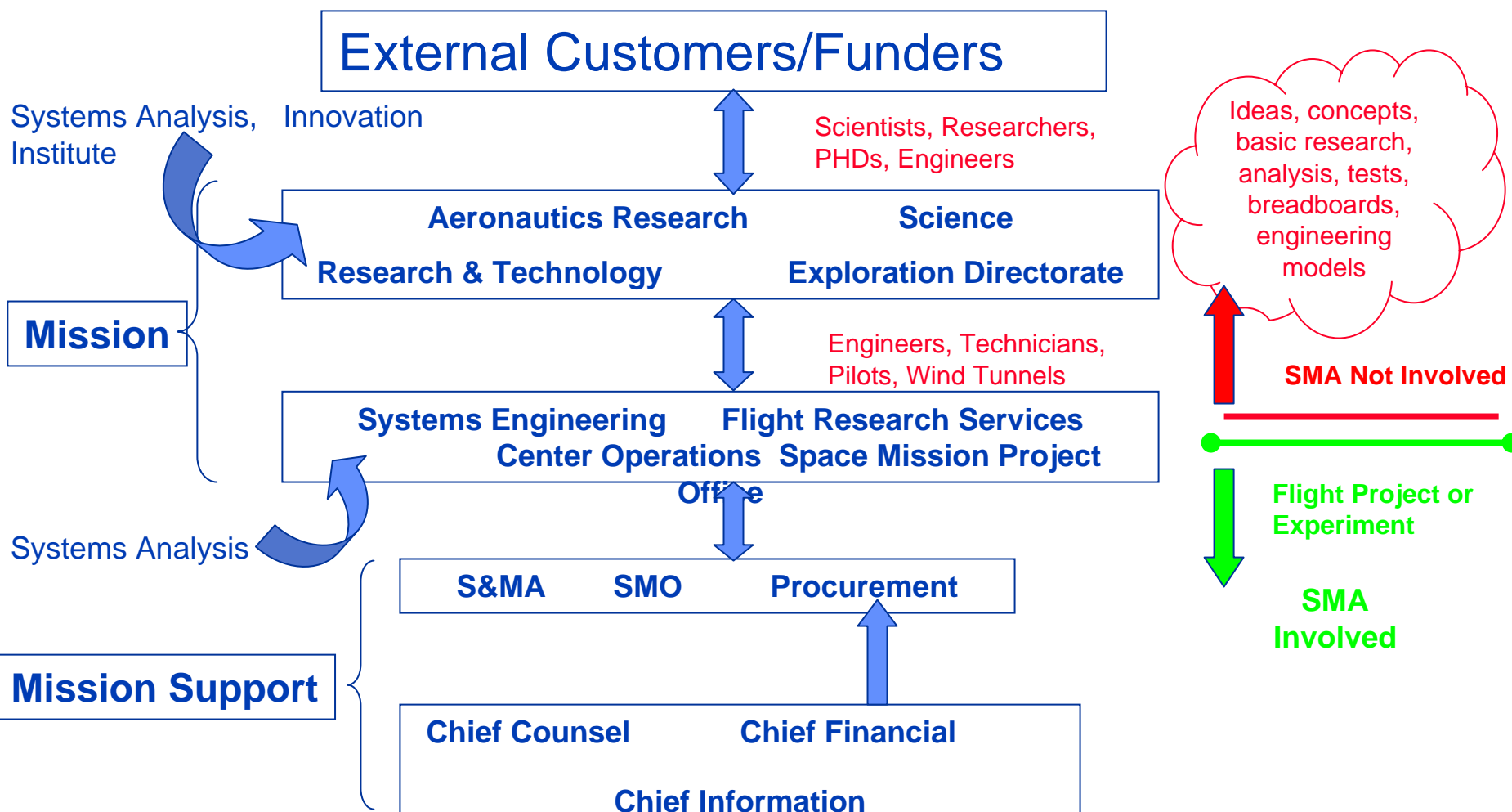
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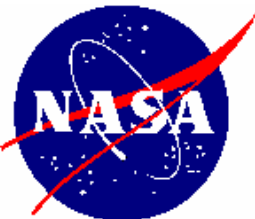
- **Several Projects at LaRC that started out as “research” progressed to flight projects without early SMA involvement**
  - **PARR**
  - **IRVE**
  - **Caused problems in requirements and contracts**
- **Recent IPS team had different interpretations and opinions relative to when & where SMA should be involved - relative to research activities**
  - **Especially from the Quality and Management teams**



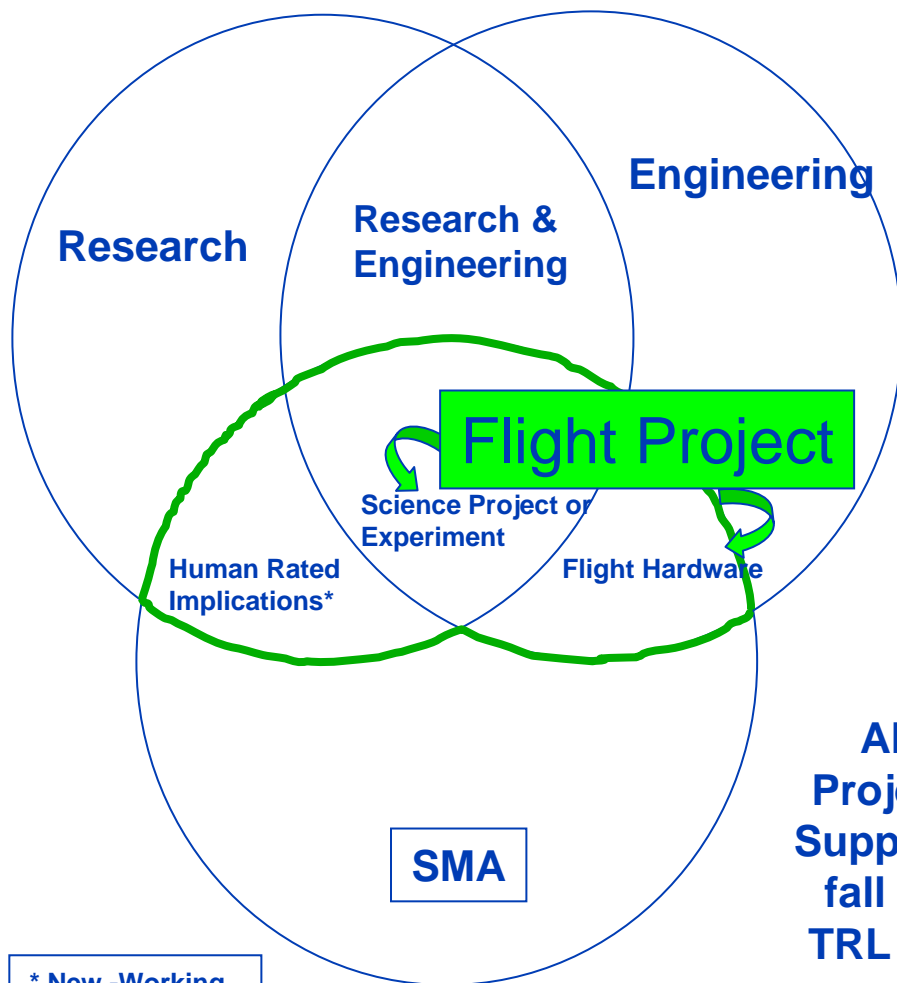


## LaRC Organizational Relationships





## Research vs. Flight Project Determination

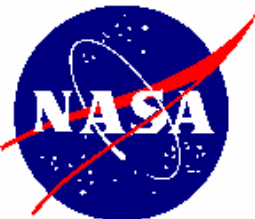


\* New -Working  
CEV Tests

**Almost all  
Projects or MA  
Support at LaRC  
fall into these  
TRL categories**

### Technology Readiness Levels Summary:

- TRL 1 Basic Principles observed and Reported
- TRL 2 Technology concept and/or application formulated
- TRL 3 Analytical and experimental critical function and/or characteristic proof-of-concept
- TRL 4 Component and/or breadboard validation in laboratory environment
- TRL 5 Component and/or breadboard validation in relevant environment
- TRL 6 System/subsystem model or prototype demonstration in a relevant environment (ground or space)
- TRL 7 System prototype demonstration in a space environment
- TRL 8 Actual system completed and “Flight qualified” through test and demonstration (ground or space)
- TRL 9 Actual system “flight proven” through successful mission operations



## Project “Challenge”

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- **PARR & IRVE were the result of “research”, “risk reduction” and “experiments” that weren’t deemed “space flight projects”- were viewed as low TRL development by engineers and researchers**
  - **Misunderstanding of when SMA should be involved**
  - **Researchers not familiar with flight experiments**
  - **New engineers (project managers) - not experienced in flight projects**
- **Subject of Most of the IPS findings!**



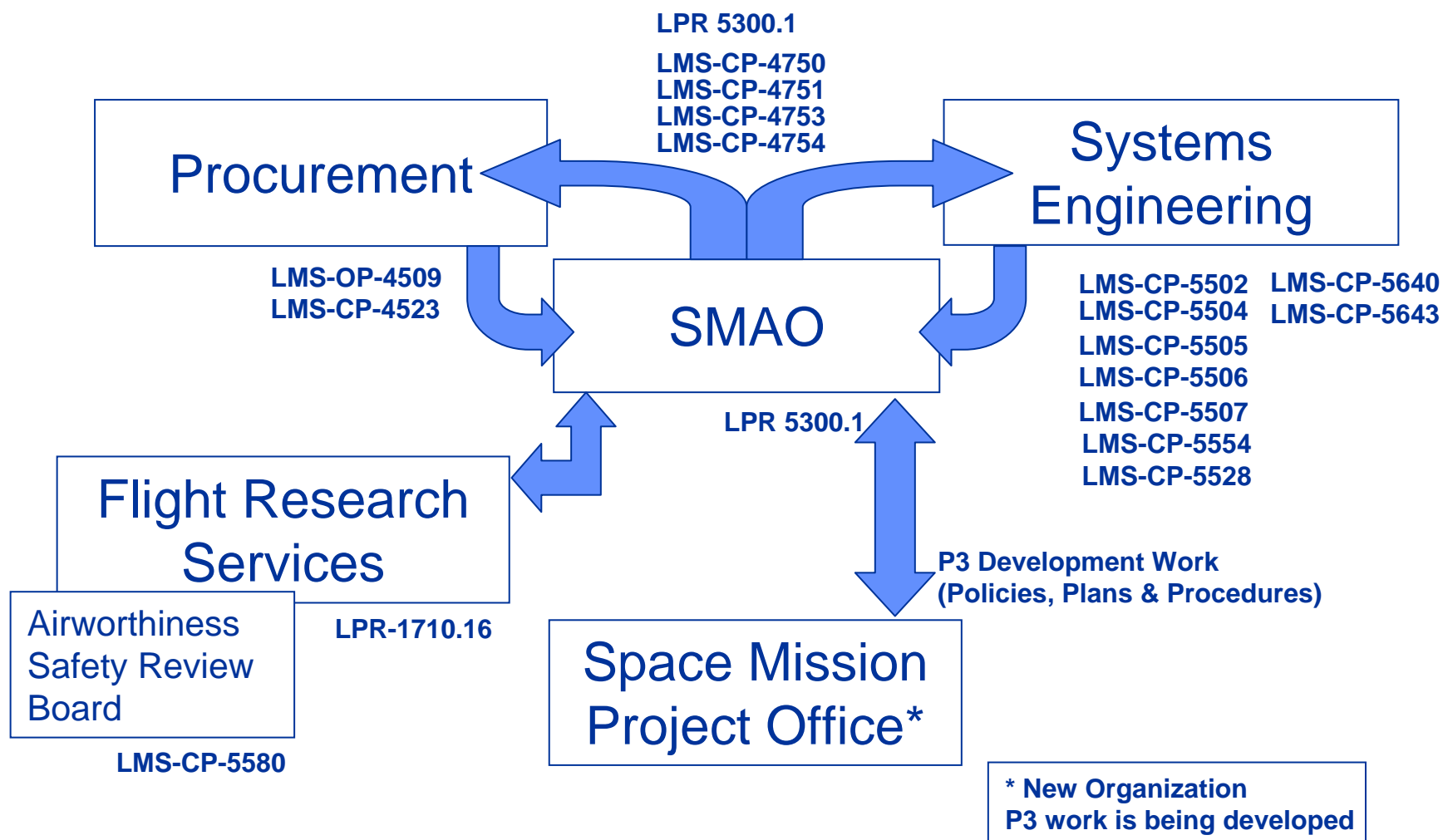
## **Fixes for the Project Challenge**

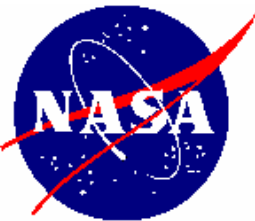
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- **Working to improve Engineering and Research knowledge of when to involve S&MA**
  - Clarify Policies and Procedures
  - Training
- **Established more viable Project Office**
  - Consolidated
  - Training Project Managers
  - Developing Project Manager's Guide
- **More SMO Involvement**
  - 60 day Review
- **Elevation of More Projects to Center Review Process**
  - Smaller Projects now reviewed @ higher level



## Major LaRC Organizational & Procedural Interfaces

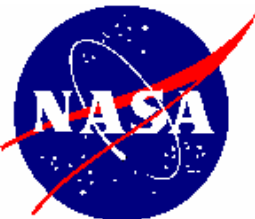




## IPS “Challenge”

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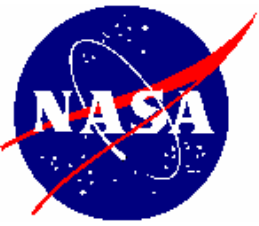
- **IPS team required a lot of discussion about LaRC SMA coverage**
  - HQ took a literal interpretation of “Program” & “Project” in HQ documents when auditing LaRC Center functions
  - IPS Quality and Management Team believed LaRC SMA should be involved in, at least the “quality” aspects of the lower TRL functions and Center Operations - minimally assessing these areas
- **LaRC disagrees**
  - LaRC SMA implements coverage based on TRL philosophy
  - LaRC not staffed for this type of coverage
  - Does it make sense? Does it add value? Are those areas broken?
  - Given finite resources - Flight Project Coverage is the highest payoff and is a better fit for SMA activities



## Fixes for the IPS Challenge

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- **LaRC SMA will better define coverage/involvement in Center Policies**
- **HQ should consider re-defining the scope of the SMA documents/requirements to include/exclude “research” activities in a manner that makes it clear to all**
  - **Tailored or categorized (i.e., 7120.5)**
  - **Exclude as necessary keeping in mind - Does it make sense?, Does it add value? and there are finite resources at the Research Centers**



## **Summary**

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- **Center has taken action to reverse downward staffing trends**
- **Work at the Center stabilized for several years (?)**
- **New proposals support is directed to be full cost**
  - **Should enable contractor or term hiring above current staffing levels**
- **Center Director is proactively supporting Safety at the Center**
- **Enjoying the “Challenge” of working Constellation with other Centers!**